

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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IN THE APPLICATION OF:

DONALD L. CLASON.

DOCKET No.: 3270

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EXAMINER: JAMES C. GOLOBOY

FILED: MARCH 16, 2004

GROUP ART UNIT: 1714

TITLE: HYDRAULIC COMPOSITION CONTAINING A  
SUBSTANTIALLY NITROGEN FREE DISPERSANT

Wickliffe, Ohio

Dated: October 10, 2007

Sir:

Declaration Under Rule 1.132

I, Betsy Butke, a person skilled in the art of hydraulic lubricants do hereby declare:

1. I, Betsy Butke, have been employed by The Lubrizol Corporation as a chemist since 1980. I obtained a M.S. from The Cleveland State University in 1988 in the field of chemistry and have 27 years experience in research in the preparation and formulation of additives and for use in lubricants and hydraulic fluids.
2. The inventor Donald Clason has retired and I am responsible for a number of projects instigated by Donald Clason. One of the projects includes the technology associated with the present invention.
3. Three substantially identical hydraulic formulations were prepared under the supervision of Donald Clason. The formulations have essentially equal phosphorus and zinc content derived from zinc dialkyldithiophosphates.

The formulations contain conventional amounts of other additives known in hydraulic fluids including antioxidants, metal deactivators, and antifoam agents. The key formulation components contributing to the performance of the present invention are shown in the following table:

| <b>Claimed Additives</b>   | <b>RF1</b> | <b>RF2</b> | <b>EX1</b> |
|--|------------|------------|------------|
| wt % Dispersant*   | 0.33       | 0.33       | 0.33       |
| wt of secondary zinc dialkyldithiophosphate                      | 0.56       | 0.6        | 0          |
| wt of primary zinc dialkyldithiophosphate                        | 0.38       | 0.38       | 1.18       |
| wt % of zinc from zinc dialkyldithiophosphate <sup>1</sup>       | 0.090      | 0.092      | 0.096      |
| wt % of phosphorus from zinc dialkyldithiophosphate <sup>2</sup> | 0.076      | 0.078      | 0.075      |

Footnote:

\* The amount of dispersant includes conventional amounts of diluent oil;

1. The wt % of zinc present has been rounded to 4 significant figures; and

2. The wt % of phosphorus present has been rounded to 4 significant figures

4. The formulations above were evaluated in the following standard tests:

(i) ASTM Method D2272 for evaluating the oxidation stability of new and in-service turbine oils having the same composition (base stock and additives) in the presence of water and a copper catalyst coil at 150 °C;

(ii) ASTM Method 2619 for determining the hydrolytic stability of petroleum or synthetic-base hydraulic fluids; and

(iii) ASTM Method D943 for evaluating the oxidation stability of inhibited steam-turbine oils in the presence of oxygen, water, and copper and iron metals at an elevated temperature. The test method is also used for testing other oils such as hydraulic oils and circulating oils having a specific gravity less than that of water and containing rust and oxidation inhibitors.

5. The three ASTM tests D2272, D2619 and D943 are tests that a lubricant is expected to perform well in if said lubricant is to perform well in a vehicle hydraulic system capable of transferring rotational energy into a stored energy reservoir and later reconverting the stored energy to rotational energy to aid propulsion.

6. The test data obtained is summarised in the table below.

| ASTM Tests | Parameter Measured                               | Typically<br>Best Results | RF1   | RF2   | EX1   |
|------------|--|---------------------------|-------|-------|-------|
| D2272      | Oxidation stability in<br>minutes                | Longer tests<br>times     | 201   | 209   | 288   |
| D2619      | Change in Copper Weight<br>(mg/cm <sup>2</sup> ) | Limit -0.2                | -1.10 | -0.45 | -0.15 |
| D943       | Weeks to Failure                                 | Longer test<br>times      | 21    | 21    | 23    |

7. Hydraulic lubricants RF1 and RF2 (containing secondary zinc dialkyldithiophosphates) do not perform well in all three tests. In contrast hydraulic lubricants containing only the primary zinc dialkyldithiophosphate (i.e. EX1) provide oxidation and hydrolytic stability in all three tests. Overall the data demonstrates that the formulation of the present invention is capable of passing all three tests.

8. I further declare that all statements herein made of my own knowledge are true and all statements herein made on information and belief are believed to be true. I understand that wilful false statements and the like are punishable by fine or imprisonment or both (18 U.S.C. 1001) and may jeopardize the validity of the application or any patent issuing thereon.

Betsy Butke  
Betsy Butke

10/10/07  
Date